Kashyapa, the Kushika father. Also their successors, the Sen kings, who restored the Hindu ritual and made Sonargaon their capital, are shown by their name to belong to the Subarna Bhanik clan.

The later kings of this dynasty became tributary to the first Mohammedan conquerors under Bukhtiyar Khiliji, and were finally dethroned by Tughral Khan and Balin, Emperor of Delhi, and his successor, Alla-uddin, made Sonargaon and its territories the eastern province of Bengal. Its subsequent history tells of the rule of successive viceroys, their rebellions and wars with the Delhi emperor, ending with the conquest of Bengal by the Afghan king Sher Shah and his clan, of whom the last ruler was Isha Khan, the converted Hindu. His marriage with the Hindu Sona Bibi, his successor, and his submission to Man Singh Akbar's general whom he had worsted in single combat, furnishes one of the most stirring tales here told. The story then tells of the building of Dacca by Jehangir's viceroy, Islam Khan, in 1608 A.D., and of the generally troublous rule of the viceroys of the Emperors Jehangir, Shah Jehan and Aurungzebe, in whose reign Dacca enjoyed twenty-five years of exceptional prosperity under Shaista Khan, Shah Jehan's first cousin, and uncle by marriage to Aurungzebe, who married Shaista Khan's niece. Under his rule the English came to Dacca, and the story of their early struggles and final conquest of Bengal is most ably told in this book. The introduction of English machine-made cloth and English thread ruined the muslin trade of Dacca, and made it first an indigo mart and afterwards what it now is, the centre of the Bengal jute trade.

J. F. HEWITT.

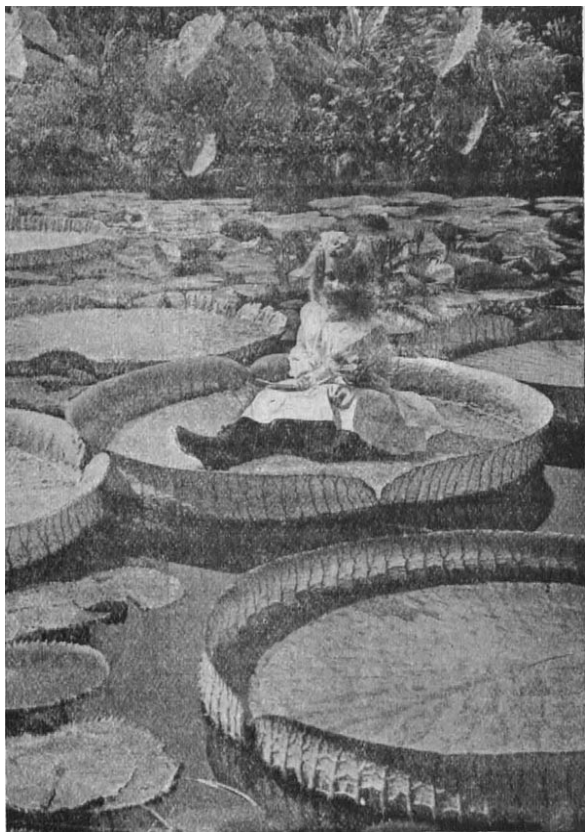
PLANT LIFE.[1]

UNDER the somewhat indefinite title "How Ferns Grow," the author refers mainly to the changes that occur in the succession of leaves from the cotyledon of the sporeling to the mature leaf of the sporophyte. It is suggested that in addition to the possibility of tracing phylogeny by means of ontogeny, a knowledge of the successive stages is likely to be of importance in the determination of species and varieties. These ideas are not, however, followed up, nor does the author offer the deductions that would be expected after the examination of a large number of series of young plants. From the illustrations it appears that a reniform shape characterises the earliest leaves of *Pellaea atropurpurea*, and the juvenile leaves of *Onoclea sensibilis* are somewhat similar; also the early leaves of the hart's-tongue and the walking fern, *Camptosorus rhizophyllus*, show similarity. But the figures given and the number of species examined are too few to permit of much, if any, generalisation.

Books on plant life are becoming numerous, too numerous, and yet books on the subject suited to the special requirements of different schools are not obtainable. Of the various books written for children in elementary schools, the "Study of Plant Life," by Miss Stopes, is quite the most logical and intelligent that we have seen.

Beginning with the physiology of the plant, the first object is to show that a plant lives, that it breathes, eats, grows, and moves. These functions are severally made apparent by simple experiments that can for the most part be carried out by children, and are explained with due care to impress their significance. The parts of the plant body and their uses are then discussed, and this prepares the way for the descriptions of their more marked and common modifications. The fourth part briefly enumerates the characters of the five great classes of plants. Passing to the consideration of plants in their homes, typical plant formations are described, and finally it is indicated how a botanical survey is made and plotted.

The foundation of the book is laid in the first part, treating of the plant's vitality, where the argument is well set out. The only suggestions that occur are of a minor nature, such as recommending other plants,



Victoria Regia in a public park in Minnesota. Reduced from an illustration in "The Romance of Plant Life."

the fuchsia or *Eupatorium adenophorum*, rather than the vine for root pressure, directing attention to the necessity of setting up a large number of culture solutions, &c. Throughout the book it will be found that the information is essentially clear and practical, the specimens selected for study easily obtainable, and the arrangement well balanced. While the figures generally are good, the plates illustrating water-plants and bladder-wrack are specially clever reproductions; altogether the book provides an admirable presentment of botanical instruction for children.

"Plant Life," by Mr. H. C. Jones, in contrast with the last, provides a series of notes on suitable work for nature-study classes.

It is divided into two portions, the first referring to plant life in the garden, the second to plant life in the school. The former includes chapters on twigs, bulb beds, insect fertilisation, underground stems and roots

1 "How Ferns Grow." By M. Slosson. Pp. vii+156. (New York: Henry Holt and Co.; London: Geo. Bell and Sons, 1906.) Price 12s. 6d. net.

"The Study of Plant Life for Young People." By M. C. Stopes. Pp. xii+202. (London: de la More Press, 1906.) Price 2s. 6d. net

"Plant Life: Studies in Garden and School." By H. F. Jones. Pp xii+260. (London: Methuen and Co., n.d.) Price 3s. 6d.

"The Romance of Plant Life." By G. F. Scott-Elliot. Pp. 380. (London: Seeley and Co., 1907.) Price 5s.

"The Green Gateway: a Peep into the Plant World." By F. G. Heath. Pp. xi+138. (London: The Country Press, n.d.) Price 3s. net.

creeping plants, and other modifications. Strange to say, modifications of flower form are omitted except in the occasional notes. The second is a physiological course dealing with the energies of the plant. This is more systematic in arrangement, and the experiments are tersely explained, but no new ideas or special hints are offered. The methods suggested for setting up some of the experiments are by no means the most practical, to mention only the growing of a seedling in a funnel, or extracting chlorophyll by boiling the leaf in alcohol over a Bunsen flame. As an indication of observational and experimental work that can be performed with simple apparatus, the book will be found serviceable, and the appendix contains a useful list of plants for growing.

Mr. Scott-Elliot brings to his subject an extensive knowledge of the ways of plants, and the instinct of imagination that enables him to appreciate the romance connected with the facts he has collected. He relates, however, no tales so fascinating as the accounts one has read of the adventures of collectors in quest of orchids or other rare plants, nor is any attempt made to depict that most attractive of all phases of plant life, the tropical forest. The author has selected most of his scenes from non-tropical regions, except where he writes of mangrove swamps and deserts. The various relationships between animals and plants, specialisations of flowers, fruit and seed, and of the plant generally are among the subjects treated, and economic botany receives a due share of recognition. There is no want of variety in the book; in fact, the fragmentary nature of the subject-matter constitutes its chief defect, and much of the information whets the appetite for more. The author has, we think produced his best results where, as in the sketch contrasting ancient and modern Britain, he pursues a continuous topic.

As a compilation of curious facts about plants, spiced with occasional grains of humour and light caustic satire, the reader will find much of passing interest and not a little that is worthy of closer attention. The best illustrations represent economic scenes, but a more romantic subject is shown in the picture reproduced on the preceding page.

There are various ways of appealing to the youthful mind, that adopted by the author of "The Green Gateway" being to arouse interest by copious allusions to magic, fairy work, and jewels. Although fairy tales may be useful to stimulate the imagination, it is doubtful whether they form a suitable medium in which to portray science. A tree and its parts form the central subject of the book, but it is probable that children will be most interested in the tales of the animal inhabitants and visitors of the tree, that are attractively described without reference to fairies and magic.

PROF. A. F. W. PAULSEN.

IT is with great regret that we chronicle the death of Prof. Adam F. W. Paulsen, which occurred in Copenhagen on January 11. Born in 1833 at Nyborg, in the island of Fünen, Paulsen studied at the University of Copenhagen, in which town he subsequently held the position of professor of physics at the Lycée. In 1884 he was appointed director of the Danish Meteorological Institute, one of the most important official meteorological positions, in view of the fact that the Danish Institute is responsible for the meteorological organisations of Greenland and Iceland. He was also a member of the Permanent International Meteorological Committee.

Among Prof. Paulsen's most important scientific labours must be reckoned his researches on the aurora borealis. His attention was first actively directed towards this phenomenon during his stay at Gothaab in 1882–3 as head of a scientific expedition sent out by the Danish Government. The question of the aurora remained one of absorbing interest to Paulsen, and in 1899–1900 he obtained from the Government the means for equipping an expedition to visit Iceland for the purpose of studying the spectrum of the aurora with the aid of modern photographic methods. At the comparatively advanced age of sixty-six years he assumed personal command of the expedition, and brought back with him some highly interesting results. He read a brief account of these before the British Association at the Southport meeting in 1903, which he attended as a member of the Permanent International Meteorological Committee.

As director of the Danish Meteorological Institute, Prof. Paulsen was the head of that meteorological organisation of which the area of observation lies nearest to the North Pole. He never ceased to point out the intimate connection which exists between the meteorological conditions of Greenland and Iceland and those prevailing over Europe, and it is largely owing to his efforts that, after many years of discussion and negotiation, Iceland has at length been brought into telegraphic communication with Europe. The daily service of meteorological messages which was established shortly before his death is likely to prove of great value both in the practical matter of forecasting and in the study, from the scientific point of view, of the permanent Icelandic low-pressure system and its influence on the weather of north-western Europe.

Prof. Paulsen was a familiar figure at international scientific meetings, where his charm of manner, combined with great accuracy of judgment and a clear mode of expression, rendered him deservedly popular. His last visit to this country occurred in the summer of 1904, when he attended the meeting of the International Association of Academies as delegate of the Royal Danish Society of Sciences.

NOTES.

AT the annual meeting of the British Science Guild, to be held at 4 p.m. on Monday next, January 28, at the Mansion House, under the presidency of the Lord Mayor, the Right Hon. R. B. Haldane will deliver an address in relation to the work of the Guild. Other speakers will probably be the Hon. and Rev. E. Lyttelton, Sir David Gill, Sir Wm. Mather, Sir Henry Roscoe, Sir Philip Magnus, M.P., Prof. Meldola, Mr. A. Haworth, M.P., Mr. Mosely, and Mr. Verney.

WE regret to see the announcement that Miss Agnes M. Clerke, the gifted author of several well-known works on astronomical subjects, died on January 20 at the age of sixty-four years. The first important work on astronomy written by Miss Clerke was the "Popular History of Astronomy during the Nineteenth Century," published in 1885. Other works of outstanding merit are "The System of the Stars" (1890) and "Problems in Astrophysics" (1903). Her command of language and acquaintance with astronomical literature were extraordinary, and empowered her to produce books distinguished by literary finish as well as by scientific value. Miss Clerke was a most industrious compiler of methods and results of astronomical investigation. The "History of Astronomy" was her most valuable contribution to scientific literature; and her later works, though marked by the same inspiring style, dealt with the more special aspects of astrophysics. In